

Claims

1. A pressurisation system comprising:
 - a vessel having a chamber for receiving fluid thereinto, the fluid having a pressure,
 - a plunger for enclosing a portion of the chamber to form an enclosure, the enclosure having a volume and the plunger being movably coupled to and for cooperation with the chamber to reduce the volume of the enclosure; and
 - 10 a positioning device for interacting with the plunger to impede the reduction of the volume of the enclosure,
 - 15 wherein when the fluid is enclosed within the enclosure, the plunger cooperates with the chamber to reduce the volume of the enclosure thereby increasing the pressure of the fluid.
2. The pressurisation system as in claim 1, wherein the chamber is shaped and dimensioned for the passage of the plunger therethrough and for the reciprocation of the plunger therewithin, the plunger for reciprocating along a longitudinal axis of the chamber.
- 25 3. The pressurisation system as in claim 2, wherein the longitudinal axis of the chamber is generally parallel to the direction of gravitational acceleration.
4. The pressurisation system as in claim 2, the chamber having an outlet for discharging fluid from the enclosure.
- 25 5. The pressurisation system as in claim 4, further comprising:
 - 30 an outlet conduit extending from the outlet to a desalination system, the outlet conduit being in fluid communication with the enclosure; and

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an outlet valve having an open position and a closed position for correspondingly permitting and impeding flow of fluid from the enclosure to the desalination system.

5 6. The pressurisation system as in claim 2, the chamber having an inlet for introducing fluid into the enclosure.

7. The pressurisation system as in claim 6, further comprising:

10 an inlet conduit extending from the inlet to a water source, the water source having a water level and the inlet conduit being in fluid communication with the enclosure; and

15 an inlet valve having an open position and a closed position for correspondingly permitting and impeding flow of fluid from the water source to the enclosure.

8. The pressurisation system as in claim 7, wherein the chamber of the vessel is disposed vertically below the water level of the water source.

20 9. The pressurisation system as in claim 3, the plunger having a weight for gravitationally applying a compression force to the fluid and thereby reducing the volume of the enclosure and increasing the pressure of the fluid.

25 10. The pressurisation system as in claim 9, wherein the positioning device comprising:

a hoist assembly being coupled to the plunger; and

an actuator being coupled to and for interacting with the hoist assembly to position the plunger along the compression axis.

30 11. The pressurisation system as in claim 10, wherein the hoist assembly comprising a pulley assembly.

12. The pressurisation system as in claim 10, wherein the actuator is an electric motor having a brake assembly for interacting with the pulley assembly to impede the reduction of the volume of the enclosure.
- 5 13. A pressurisation method comprising the steps of:
 - providing a vessel having a chamber;
 - receiving fluid into the chamber, the fluid having a pressure,
 - 10 enclosing a portion of the chamber with a plunger to form an enclosure, the enclosure having a volume, and the plunger being movably coupled to and for cooperation with the chamber to reduce the volume of the enclosure; and
 - 15 providing a positioning device for interacting with the plunger to impede the reduction of the volume of the enclosure,
 - 20 wherein when the fluid is enclosed within the enclosure, the plunger cooperates with the chamber to reduce the volume of the enclosure thereby increasing the pressure of the fluid.
14. The pressurisation method as in claim 1, wherein the chamber is shaped and dimensioned for the passage of the plunger therethrough and for the reciprocation of the plunger therewithin, the plunger for reciprocating along a longitudinal axis of the chamber.
- 25 15. The pressurisation method as in claim 14, wherein the longitudinal axis of the chamber is generally parallel to the direction of gravitational acceleration.
- 30 16. The pressurisation method as in claim 14, the chamber having an outlet for discharging fluid from the enclosure.

17. The pressurisation method as in claim 16, further comprising the steps of:
providing an outlet conduit extending from the outlet to a desalination system, the outlet conduit being in fluid communication with the enclosure;
and
providing an outlet valve having an open position and a closed position for correspondingly permitting and impeding flow of fluid from the enclosure to the desalination system.

18. The pressurisation method as in claim 17, the chamber having an inlet for introducing fluid into the enclosure.

19. The pressurisation method as in claim 18, further comprising the steps of:
providing an inlet conduit extending from the inlet to a water source, the water source having a water level and the inlet conduit being in fluid communication with the enclosure; and
providing an inlet valve having an open position and a closed position for correspondingly permitting and impeding flow of fluid from the water source to the enclosure.

20. The pressurisation method as in claim 19, wherein the chamber of the vessel is disposed vertically below the water level of the water source.

21. The pressurisation method as in claim 15, further comprising a step of gravitationally applying a compression force to the fluid by the plunger having a weight and thereby reducing the volume of the enclosure and increasing the pressure of the fluid.

22. The pressurisation method as in claim 21, wherein the positioning device comprising:
a hoist assembly being coupled to the plunger; and

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an actuator being coupled to and for interacting with the hoist assembly to position the plunger along the compression axis.

23. The pressurisation method as in claim 22, wherein the hoist assembly 5 comprising the steps of a pulley assembly.

24. The pressurisation method as in claim 22, wherein the actuator is an electric motor having a brake assembly for interacting with the pulley assembly to impede the reduction of the volume of the enclosure.

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25. A pressurisation method for pressurising fluids comprising the steps of: receiving fluid from a water source into a chamber of a vessel, the chamber having a longitudinal axis and being formed within the vessel, the water source having a water level and the fluid having a pressure;

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enclosing a portion of the chamber with a plunger to form an enclosure having a volume, the plunger having a weight, the fluid received in the chamber being contained in the enclosure, and the plunger being movable along the longitudinal axis of the chamber to one of reduce or increase the volume of the enclosure;

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gravitationally applying a force to the fluid by the plunger along the longitudinal axis of the chamber to reduce the volume of the enclosure and thereby increasing the pressure of the fluid, the pressure of the fluid being controlled by a positioning device being coupled to the plunger for positioning the plunger along the longitudinal axis thereby controlling the amount of force applied to the fluid; and

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providing the pressurised fluid to a desalination system.

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